CLAIMS

1. A gas turbine engine comprising:

a core air flowpath;

a shaft supporting a compressor section and a turbine section arranged within the core flow path wherein the compressor section includes a high pressure compressor section that has a pressure ratio of approximately 23:1; and

wherein the turbine section includes a counter-rotating low pressure turbine comprising

an outer rotor directly driving the shaft, the outer rotor including an outer set of blades,

an inner rotor having an inner set of blades interspersed with the outer set of blades, the inner rotor configured to rotate in an opposite direction about the axis of rotation from the outer rotor,

a low pressure turbine static case that surrounds the inner and outer sets of blades,

a mid-turbine frame structure including an outer case that attaches to a fore end of the low pressure turbine static case,

a first bearing supporting the shaft for rotation relative to a mid-turbine frame structure, wherein the first bearing is positioned forward of the inner and outer sets of blades and adjacent to a connection between the low pressure turbine static case and the outer case, and

a gear system coupling the inner rotor to the shaft and configured to rotate the inner set of blades at a faster speed than the outer set of blades.

2. The gas turbine engine according to claim 1, wherein the first bearing directly supports the shaft for and is positioned radially between the shaft and the mid-turbine frame structure.

3. The gas turbine engine according to claim 2, including a second bearing supporting a fore end of the inner rotor for rotation relative to the shaft and a third bearing supporting an aft end of the inner rotor for rotation relative to the shaft.

4. The gas turbine engine according to claim 3, wherein the second and third bearings are positioned aft of the first bearing and directly support the shaft.

5. The gas turbine engine according to claim 3, wherein the first, second and third bearings are axially aligned with each other in a direction along the axis of rotation.

6. The gas turbine engine according to claim 1, wherein the gear system includes a sun gear fixed for rotation with an aft end of the inner rotor, a plurality of star gears in meshing engagement with the sun gear, and a ring gear in meshing engagement with the star gears.

7. The gas turbine engine according to claim 6, wherein the star gears are supported within a carrier that is fixed to a turbine exhaust case.

8. The gas turbine engine according to claim 1, wherein a fore end of the shaft is associated with a counter-rotating low pressure compressor.

9. A gas turbine engine comprising:

at least one shaft defining an axis of rotation;

a compressor section including a counter-rotating low pressure compressor driven by the at least one shaft and a high pressure compressor section that has a pressure ratio of approximately 23:1;

a turbine section comprising

an outer rotor directly driving the shaft, the outer rotor including an outer set of blades;

an inner rotor having an inner set of blades interspersed with the outer set of blades, the inner rotor configured to rotate in an opposite direction about the axis of rotation from the outer rotor;

a low pressure turbine static case that surrounds the inner and outer sets of blades,

a mid-turbine frame structure including an outer case that attaches to a fore end of the low pressure turbine static case,

a first bearing supporting the shaft for rotation relative to a mid-turbine frame structure, wherein the first bearing is positioned forward of the inner and outer sets of

blades and adjacent to a connection between the low pressure turbine static case and the outer case; and

a gear system coupling the inner rotor to the shaft and configured to rotate the inner set of blades at a faster speed than the outer set of blades.

10. The gas turbine engine according to claim 9, including a second bearing supporting a fore end of the inner rotor and a third bearing supporting an aft end of the inner rotor, wherein the second and third bearings are positioned directly between the shaft and the inner rotor.

11. The gas turbine engine according to claim 10, wherein the first bearing directly suports the at least one shaft for rotation relative to the mid-turbine frame structure, and wherein the second and third bearings are positioned aft of the first bearing.

12. The gas turbine engine according to claim 9, wherein an aft end of the low pressure turbine static case is attached to a turbine exhaust case.

13. The gas turbine engine according to claim 12, wherein the gear system includes a sun gear fixed for rotation with an aft end of the inner rotor, a plurality of star gears in meshing engagement with the sun gear, and a ring gear in meshing engagement with the star gears, and wherein the star gears are supported within a carrier that is fixed to the turbine exhaust case.